REMARKS

This application has been reviewed in light of the Office Action dated April 8, 2003. Claims 1-16 and 18-24 are pending in this application. Claims 21-24 have been added to provide Applicant with a more complete scope of protection. Claims 1, 2, 6, 8, 15, and 18 have been amended to define still more clearly what Applicant regards as his invention. Applicant notes that the changes to Claims 1, 2, 8, 15, and 18 have been made as to matters of form only and do not narrow the scope of any of those claims. Claims 1, 2, 5-9, 12, 14, and 20-24 are in independent form. Favorable reconsideration is requested.

The Office Action rejected Claim 20 under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 5,838,888 (Oda), and rejected Claims 1-16, 18, and 19 under 35 U.S.C. § 103(a) as being unpatentable over Oda in view of U.S. Patent No. 5,222,818 (Akiyama et al.). Applicant respectfully traverses these rejections.

Applicant submits that independent Claims 1, 2, 5, 7-9, 12, 14, and 20, together with the remaining claims dependent thereon, are patentably distinct from the cited prior art at least for the following reasons.

The aspect of the present invention set forth in Claim 1 is a data processing method for processing data in an image printing apparatus subjected to time-division drive of a printhead. The apparatus includes an editing buffer and a print buffer, and the data processing method includes a step of rearranging one word of data corresponding to a plurality of contiguous print elements provided on the printhead, that is stored divisionally

in two or more address regions in the editing buffer, and storing the data in one address region in the print buffer.

One important feature of Claim 1 is that an image printing apparatus is subjected to time-division drive of a printhead.

Oda, as understood by Applicant, relates to an image recorder. The Office Action at page 3, section 6, states that Oda discloses a data processing apparatus for processing data in an image printing apparatus "subjected to time-division drive of a printhead" and asserts that column 3, line 64, to column 4, line 8, provides support for this assertion. Applicant notes that this section discusses the head driver 19, as shown in FIG. 6, and 2-input AND circuits 32, and a serial-to-parallel conversion circuit 31 included in the head driver 19, which takes data outputted serially from a print buffer and converts the data into a parallel format. The nozzles of the print head are then driven by the parallel data, the parallel data being used to drive all the nozzles of the print head at the same time. Applicant submits that nothing in this section, or any other section of Oda, would teach or suggest an image printing apparatus that is subjected to time-division drive of a printhead.

Akiyama et al., as understood by Applicant, relates to a tape printer apparatus and control method. The Office Action at page 4 asserts that Akiyama et al. discloses memory for an editing buffer and a print buffer. However, the Office Action does not state, and Applicant has not found anything in Akiyama et al., that would teach or suggest an image printing apparatus that is subjected to time-division drive of a printhead.

Accordingly, Applicant submits that at least for this reason, Claim 1 is patentable over the subject matter of these two patents, when taken separately or in any proposed combination.

Independent Claims 2, 5, 7-9, 12, 14, and 20 include the same feature of an image printing apparatus that is subjected to time-division drive of a printhead, as discussed above in connection with Claim 1. Accordingly, Claims 2, 5, 7-9, 12, 14, and 20 are believed to be patentable for at least the same reasons as discussed above in connection with Claim 1.

The aspect of the present invention set forth in Claim 6 is an image printing apparatus for processing data in which one word consists of eight bits. The apparatus includes a printhead driving means, an editing buffer, print buffer, and a data transfer circuit. The printhead driving means discharges ink from four contiguous nozzles of a printhead at different times. The print buffer outputs image data to the printhead driving means. The data transfer circuit reads data from the editing buffer in units of 16-bit data and transferring the data to the print buffer. Moreover, the data transfer circuit combines and transfers 4-bit data read currently and corresponding to four contiguous nozzles of the printhead, and 4-bit data previously read.

Important features of Claim 6 are that the data transfer circuit combines and transfers 4-bit data read currently and corresponding to four contiguous nozzles of the printhead, and 4-bit data previously read. Support in the specification for these features can be found at least from page 11, line 15, to page 12, line 20.

Applicant submits that nothing has been found in the proposed combination of Oda and Akiyama et al., and nothing has been stated in the Office Action, that would teach or suggest these features. Thus, at least for this reason, Claim 6 is patentable over the subject matter of these two patents, when taken separately or in any proposed combination.

Applicant submits that new independent Claim 21 relates to a transfer circuit of an image processing apparatus for transferring data from an editing unit to a print unit. The transfer circuit includes a first register that stores 16-bit data, a second register that stores 4-bit data, a control unit that controls the transfer of data from the first and second register to the print unit, and an address generating unit that generates an address for the data when the control unit transfers the data. Applicant notes that support in the specification for the features of Claim 21 can be found at least from page 11, line 18, to page 12, line 20, with reference to Figure 5. Applicant submits that nothing has been found in the cited prior art that would teach or suggest the features of Claim 21 as discussed above, and for this reason, Applicant submits that Claim 21 is patentable over the cited prior art.

Additionally, new independent Claim 22 is a method claim that corresponds to apparatus Claim 21. Claim 22 also recites that the generated address includes a transfer-origin identifier and transfer-destination identifier. Applicant notes that support in the specification for the features of Claim 22 can be found at least from page 11, line 18, to page 14, line 2, with reference to Figures 5 and 6. Applicant submits that nothing has been found in the cited prior art that would teach or suggest the features of Claim 22 as

discussed above, and for this reason, Applicant submits that Claim 22 is patentable over the cited prior art.

Applicant submits that new independent Claim 23 relates to a data transfer circuit of an image processing apparatus that includes an editing buffer that stores data, a print buffer that prints data, a control unit that controls the transfer of data from the editing buffer to the print buffer, and an address generating unit that generates an address for the data transferred by the control unit. The data comprises 8-bit image data arranged vertically or horizontally. Applicant notes that support in the specification for the features of Claim 23 can be found at least at page 14, from line 3 to line 15, with reference to Figures 7A-7C. Applicant submits that nothing has been found in the cited prior art that would teach or suggest the features of Claim 23 as discussed above, and for this reason, Applicant submits that Claim 23 is patentable over the cited prior art.

Applicant submits that new independent Claim 24 relates to a transfer circuit of an image processing apparatus for transferring data from an editing unit to a print unit. The transfer circuit includes a conversion register that stores data having vertical components, a selector that extracts the vertical-component data from the conversion register, a register that stores the data, a control unit that controls the selector and the transfer of data from the register to the print unit, and an address generating unit that generates an address for the data when the control unit transfers the data. Applicant notes that support in the specification for the features of Claim 24 can be found at least from page 17, line 20, to page 18, line 6, with reference to Figure 10. Applicant submits that

nothing has been found in the cited prior art that would teach or suggest the features of Claim 24 as discussed above, and for this reason, Applicant submits that Claim 24 is patentable over the cited prior art.

In view of the foregoing amendments and remarks, Applicant respectfully requests favorable reconsideration and early passage to issue of the present application.

Applicant's undersigned attorney may be reached in our New York office by telephone at (212) 218-2100. All correspondence should continue to be directed to our below listed address.

Respectfully submitted,

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